

THE VEGATION OF PINE ISLAND
DADE COUNTY, FLORIDA

by

Frances R. Elder

DUKE
UNIVERSITY



LIBRARY

DUKE UNIVERSITY LIBRARY

MANUSCRIPT THESES

This volume may be consulted freely, but the literary rights of the author must be respected. No passage may be copied or closely paraphrased without the previous written consent of the author. If the reader obtains assistance from this volume he must give credit in his own work.

This thesis by Frances Ruth Elder has been used by the following persons, whose signatures attest their acceptance of the above restrictions.

[A library borrowing this thesis for use by one of its patrons should secure the signature of the user.]

Name

Address

Date

Duke University Library

The use of this thesis is subject to the usual restrictions that govern the use of manuscript material. Reproduction or quotation of the text is permitted only upon written authorization from the author of the thesis and from the academic department by which it was accepted. Proper acknowledgment must be given in all printed references or quotations.

FORM 412 DM 6-41

THE VEGETATION OF PINE ISLAND, DADE COUNTY, FLORIDA

by

Frances R. Elder

ACKNOWLEDGMENTS

The writer wishes to acknowledge her indebtedness to Dr. E. J. Harting for advice and criticism throughout the period of study and preparation of this paper; to Dr. E. L. Blomquist for the identification and checking of grasses; to Mr. W. B. Russell for the identification of many tropical and plants; and to Mr. Ralph Robbins for the photography.

F. R. E.

A thesis

**submitted in partial fulfillment
of the requirements for the
degree of Master of Arts
in the Graduate School
of Arts and Sciences
of
Duke University**

1941

7
A.M
E37

TABLE OF CONTENTS

INTRODUCTION	1
Geology	2
Topography	3
Soils	7
Climate	7

ACKNOWLEDGMENTS

The writer wishes to acknowledge her indebtedness to Dr. H. J. Oosting for advice and criticism throughout the period of study and preparation of this paper; to Dr. H. L. Blomquist for the identification and checking of grasses; to Mr. W. M. Buswell for the identification of many tropical plants; and to Mr. Ralph Dobbins for the photography.

Handbook	82
Bank Notes	83
SUMMARY	85
LITERATURE CITED	87
APPENDIX	89

F. R. E.

411719

411719

TABLE OF CONTENTS

INTRODUCTION	1
Geology	2
Topography	5
Soils	7
Climate	7
Vegetational History	7
METHODS	10
HABITATS AND THE FACTORS AFFECTING VEGETATION ...	11
THE PLANT COMMUNITIES	16
Pineland	16
Banana Hole	20
Hammock	21
Sink Holes	23
SUMMARY	25
LITERATURE CITED	27
APPENDIX	29

411719

THE VEGETATION OF PINE ISLAND, DADE COUNTY, FLORIDA

INTRODUCTION

Very little intensive ecological research has been done in southern Florida and the little available botanical literature is made up either of generalized descriptions of extensive areas or superficial sketches. Harper (1927) discusses the major plant communities of the extensive area located south of Tampa on the west coast, and Melbourne on the east coast. Hershberger (1914) presents "a record of the original appearance of the country before the march of civilization." Dodge (1894), Batchley (1911), and Simpson (1932) have written descriptions from the naturalists' point of view. Certainly the most intensive botanical work done in Florida was that of Dr. J. K. Small. Unfortunately his publications are largely taxonomic and his knowledge of the plant communities is available almost exclusively as habitat notes in his floras and manuals.

There are numerous plant communities and habitats in the vicinity of Miami deserving of more botanical study than they

have received. With the increase of population and consequent expansion of agricultural and economic activities many of these natural areas have been permanently destroyed. Studies of local areas such as made by McAllister (1938) of Key Biscayne and Phillips (1940) of Castellow Hammock are increasingly desirable.

This paper contains the results of a study of an "island" pineland. The "islands", distinctive of southern Florida, are rocky keys (Fig. 1) surrounded by glades (Gifford 1934). This island is also representative of relatively unburned pine-lands surrounding Miami.

Pine Island is located twenty-five miles south of Miami and a mile east of Naranja and Homestead (Sec. 35, Township 56 S, Range 39 E). It is about a mile and a half wide and three and a half miles long.

Geology

The island is made up of a rocky formation called Miami oölite which is a calcareous sedimentary deposit (Fig. 2) of the Pleistocene age. This rock is said to occur as far north as Delray. There it is present as a narrow belt and is mostly concealed by sand. But southward the area of oölite gradually becomes more extensively and the sand mantle thins out. In the neighborhood of Homestead the visible area of oölite is about ten miles wide. The thickness of the deposit on Pine Island varies from sixteen to eighteen feet. The maximum thickness may be thirty feet along the coastal outcrops and



Figure 1. Pine Island as seen from the
surrounding gladeland.



THE UNIVERSITY OF CHICAGO
LIBRARY



Figure 2. Section of a ditch on Pine Island showing the character of the substrat., Miami oölite.



Fragment of a manuscript page, showing
the beginning of a chapter, with the title
"The first book of the history of the world"

perhaps more inland. Around Miami it rests on sedimentary rock or a coral formation. The rock hardens on exposure and is used in making roads and buildings. It weathers into sharp angular fragments, which lie loosely on the ground (Fig. 3). Because of its soft nature the rock is easily dissolved and eroded by water. Pot holes (Fig. 3) of all sizes are common and the rock surface is always very rough and uneven.

Topography

The limestone country is one of little relief. The maximum elevation south of Miami may be about thirty feet above sea level, but this rise is so gradual as to be almost imperceptible (Marshberger, 1914).

The Miami pineland is intersected at right angles by a considerable number of "glades" which extend inland from the coast and average about five miles in length. These glades are elongated, approximately straight, depressions which vary from a few inches to a few feet in depth, and from about fifty yards to half a mile in width. They were presumably formed mostly by solution. The soil is soft gray marl with the chief ingredient being calcium carbonate.

The elevation of Pine Island is from seven to nine feet above sea level, and about four feet above the glade land which surrounds it. During the rainy seasons of the year the water from the glade land covers the edges of the island thus causing the seeds from the glade grasses to be carried over on the pineland.

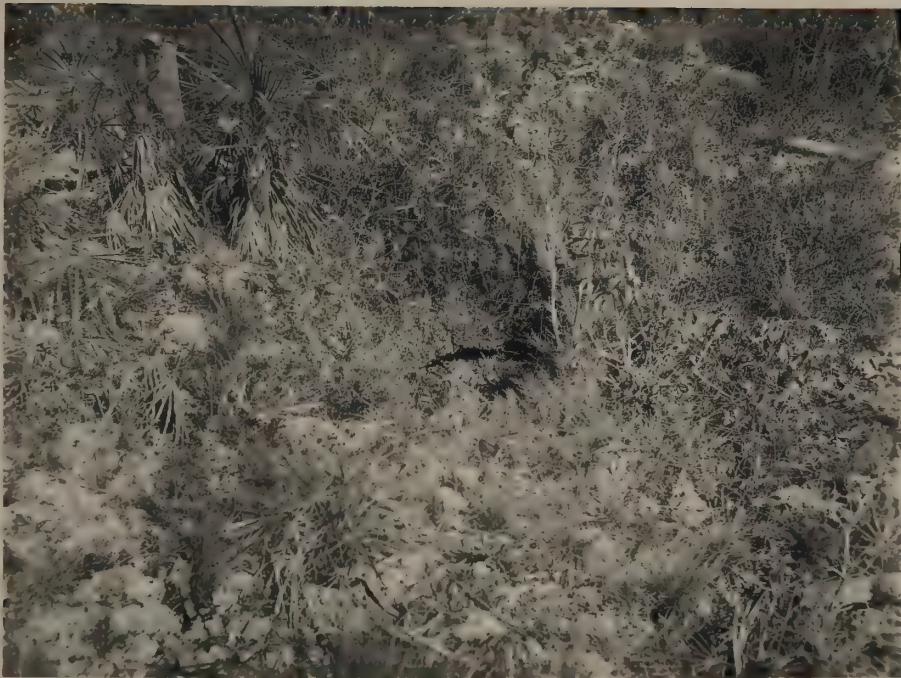


Figure 3. Typical rocky surface soil and scanty cover in pineland, and a shallow sink hole.



THE UNIVERSITY OF CHICAGO PRESS
54 EAST 57TH STREET, NEW YORK, N. Y. 10022
1980 1000 000000

Soils

On Pine Island the bare limestone is exposed nearly everywhere. In some cavities there is enough humus to support vegetation, while in others is found a reddish clay. In one large cavity a highly organic black plastic muck is found. The plants growing on the rock seemed to be of a xerophytic nature whereas those found in the cavities where water was more plentiful appeared to be of a mesophytic nature. The same plants found growing here were much larger than the same plants in the pineland.

Climate

For Homestead which is two miles away, the average temperature over a period of fourteen years was 67.3° F. for January and 81.9° F. for July.

The mean annual rainfall is 62.75 inches, 53% falling from June to September and only 25% from November to April. There are two maximum periods of rainfall, a lesser one in June and a higher one in September. The lowest monthly amount was a little less than one inch in December and the highest in September of 9.75 inches (Florida section of the United States Weather Bureau from the 18th Annual Report of the Florida Geological Survey).

Vegetational History

The island was first homesteaded in 1912 when Mrs. Olie

Peterson and others received patents from Woodrow Wilson, President. Much of the historical information was obtained verbally from her.

The virgin timber, Pinus caribaea, was all cut by Drake and Wynn early in the 20th century. The present trees are all second growth and now these are again being cut for commercial purposes. Some of the stumps of recently cut trees show thirty-eight growth rings.

Fire, storms, drainage, and cultivation have also contributed to the present day vegetational aspect of the island. Years ago fire was common. But with the building of roads, and with the drainage of 7,000 acres of glades in the vicinity of Pine Island for truck farming, fire hazards increased and large parts of the island burned over annually. Within the past year a fire tower has been erected five miles from the island and now sweeping fires are much less frequent.

The great hurricane of 1926 destroyed, or seriously injured, many of the larger trees on the island. As a result of the hurricane of 1929, salt water was carried into the glades in such quantities as to cover the highest parts of the island to a depth of six inches. Much of the vegetation was destroyed by the salt water and its effects are still apparent.

Approximately fifty acres of Pine Island have been cleared for Avocado groves. However, twenty acres were destroyed by the salt water previously mentioned. Sixty acres are in citrus groves which include orange, grapefruit, and lime trees,

and twenty acres are in tomatoes and beans.

The remainder of the island which was studied in detail, is covered with pine forest. Among the pines are located sink holes, banana holes, and hammocks. The southern half of the island which has the most varied vegetation is now being cleared by the government for an Air Training base. Only 300 acres of the pineland remain untouched by man.

METHODS

Collections of the native plant life of Pine Island have been made over a period extending from August, 1940 to June, 1941. In the bi-monthly trips made to the island, the entire area was covered once and numerous trips were made to the more interesting habitats. The specimens have been deposited in the Duke University Herbarium.

In identification and nomenclature, Small's manual of the Southeastern Flora, 1933, and Small's Ferns of Florida, 1931, were used. Mr. W. M. Buswell, Curator of the University of Miami Herbarium, assisted the writer with the determination of many difficult specimens. Dr. H. L. Blomquist identified or checked the determinations of the grasses.

HABITATS AND THE FACTORS AFFECTING VEGETATION

Edaphic factors are of the greatest importance in determining the vegetation of Pine Island. Soil, in the ordinary sense, is almost completely lacking and the plants appear to be growing directly out of the oolitic rock which is exposed everywhere. However, the rock is extremely porous and the roots are embedded in the little humus that has collected in the pores. Water which falls as rain, is rapidly lost through the pervious stone. During the drier seasons which come during the cooler part of the year, the lack of water is not so serious because the rate of evaporation is not great. According to Gifford (1934) the water table is rather near the surface, at least within reach of the tree roots and the rock has good capillarity.

As has been previously mentioned, fire has in the past been common on the island. Some idea of its effects on the vegetation may be gained from Small's (1929) description of the decline of Sphenomeria clavata. In 1907 this fern covered the entire island to such an extent that the rocky ground was

literally carpeted with it. "It grew so luxuriantly that deer would lie in the dense beds and several times they arose from their ferny beds only a few feet in front of us as we approached". In 1929 he found not a leaf of the fern and stated that very likely the fires had exterminated it. However, it was not exterminated for today the fern may be found in many of the sinks on the southeast side of the island. It is probable that the recent reduction in burning is favoring its gradual rejuvenation.

The vegetation types of the island are each associated with distinct habitats: the pineland, which is neither typically high or low as plants of both habitats can be found growing side by side; the sink hole; the banana hole; and the hammock.

The pineland is the most extensive type of vegetation found on Pine Island. It consists of a vast open forest of pine, all of one species (Pinus caribaea). These trees have small crowns and thus allow the floor of the forest to receive a great deal of light. There are very few pine seedlings. None of the mature pines have limbs lower than fifteen feet. The forest appears to be unusually open, for the second layer consists of palms, shrubs, and low trees, none reaching the lowest branches of the dominant pine.

The soil is Miami oolite that protrudes in spots above the ground covering of vines and pine needles. It is practically always dry, because of its porosity and excellent drainage.

Scattered through the pineland are about eleven depressions called banana holes. According to Harshberger (1914), this type of habitat is called a banana hole because dwarf bananas have been raised in them. They are line sinks or pot holes which exist in all sizes from four to twenty feet across. They are rounded or oval in shape and may be six inches to three feet in depth.

Banana holes apparently originate in any shallow depression in the oölitic rock. Broad leaved shrubs occupy the margins of these hollows which gradually fill with forest litter. This decays and together with the debris and soil, washed in from the surrounding higher areas by the rain, forms humus. The accumulation of humus is very slow, but as it progresses, vegetation advances centripedally until the entire area is covered and the hammock stage with greater maturity may be reached.

The soil is reddish clay (Fig. 4) or muck and is rich in organic matter. The presence or absence of water in the holes is conditioned by the rate of evaporation, the water table, and the season of the year. Several of the holes have been utilized by the negroes for the cultivation of plants. One of the holes was filled with okra, while beans occupied another.

After the trees in the depression have become larger and the center has filled in, the hammock stage is reached. However, it is difficult to distinguish clearly between the vegetation of a larger banana hole and a smaller hammock which



Figure 4. Drainage ditch which cuts through a small muck-filled banana hole in which only palmetto is growing.



THE UNIVERSITY OF CHICAGO
LIBRARY
540 EAST 57TH STREET
CHICAGO, ILL. 60637

occurs in the same region. As used in Florida, the word hammock means a dense woods of broad-leaved trees, usually Dicotyledonous, but sometimes including palmettoes. The vegetation of the hammocks and banana holes is in marked contrast to the open pine woods in which they are found (Bessey, 1911).

On Pine Island there are only two distinct hammocks. One is near the southern tip, the other is on the eastern half of the island about one mile east of the Peterson residence. Each is about thirty feet across. Growth is luxurious and the trees are so closely massed that very little light penetrates to the ground through the interlocking branches. The floor of the hammock is devoid of herbaceous vegetation. The soil is rich in humus and much more retentive of water than the adjacent pineland.

Much more plentiful than the banana holes and the hammocks on the island are the sink holes. These small pot holes are found on nearly every square yard of the eastern half of the island. They are undoubtedly formed by solution. The sides are straight and the diameter varies from one to three feet. Depths too are variable and some sinks a foot in diameter may be eight feet deep. The bottoms of the holes contain some sandy soil, and, during the rainy season, standing water.

THE PLANT COMMUNITIES

Pineland

In the pineland the following four layers are recognizable: tree layer, shrub layer, herb layer, and the ground layer. The tree layer consists of one species, Pinus caribaea or slash pine. Two palms are found beneath the trees. They are Serenoa repens, the saw palmetto and the silver-palm (Coccothrinax argentea) with silvery blades and blackish fruits. This palm often reaches a height of five or six feet (Fig. 5), on the island although it is usually smaller elsewhere.

The shrub layer includes the following: Metopium toxiferum, with its glossy green leaves, Pyraonima cuneata, Croton linearis, Tetrazygia bicolor, Guettarda scabra, and Mosier longipes.

The herbaceous third layer is made up of the ferns Anemia adiantifolia, Pycnosoria pinetorum, and Pteris caudata (Fig. 6). Zamia integrifolia or starch plant is very common. The leathery leaves resemble those of the ferns. Peirania bahamensis with its bright yellow flowers is plentiful.

The ground floor layer consists of the grass Aristida stricta, Chiococca pinetorum whose snowy berries ornament the pine floor along with the purplish white flower of Jacquemontia

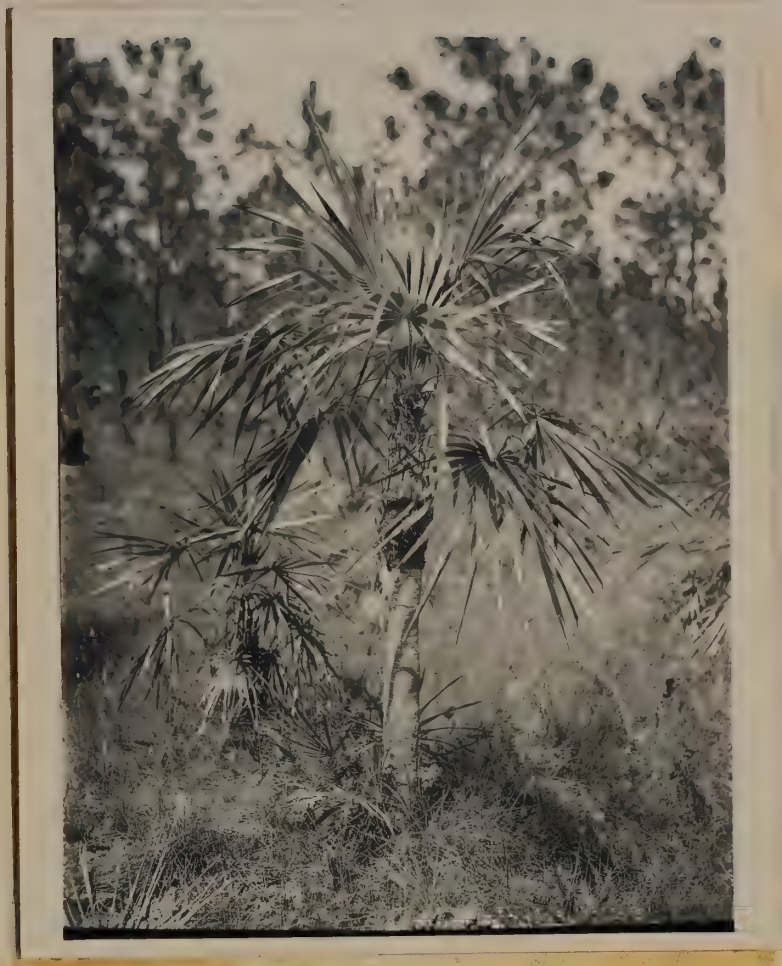


Figure 5. The characteristic palm of Pine Island, Coccothrinax argentea.



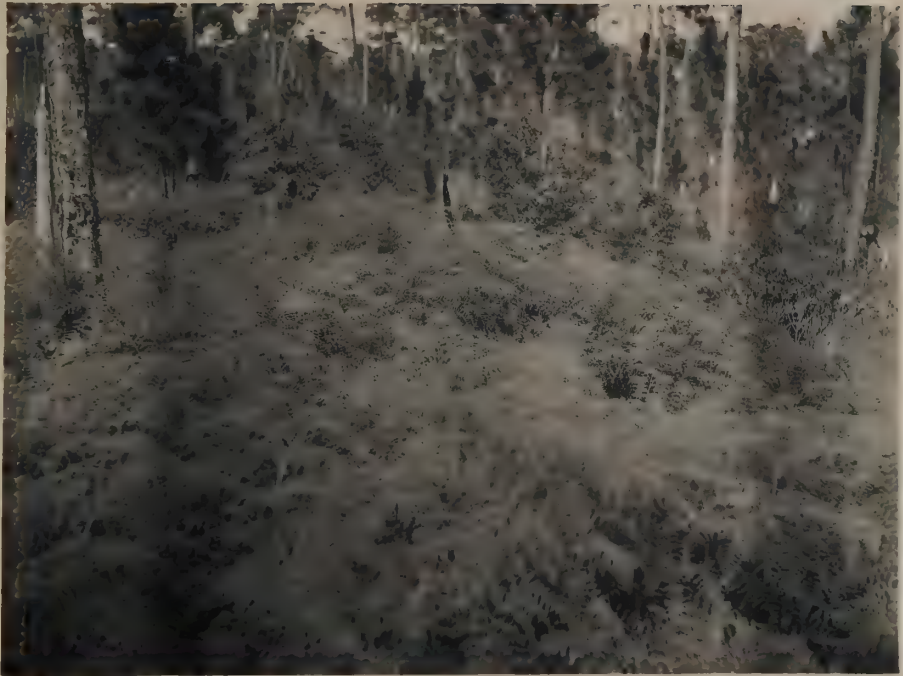


Figure 6. A dense pure stand of Pteris
caudata in open pineland.



View of the [illegible] from the [illegible]

Curtissii; the prostrate leathery shrub Ernosea angusta; and Houstonia filifolia.

In the pineland that has been burned over within the last two years the vine covering is almost lacking. Only a few shrubs appear in the recently burned pineland (Metopium toxiferum, Mosier longipes, Chamaecrista brachista, Guettarda sesbra) and they are apparently derived from sucker sprouts that grow from fire-resistant subterranean parts. The herb layer consists of the ferns Anemia adiantifolia and Pycnodoria pinetorum. Jacquemontia Curtissii alone remains as a ground covering.

Fringing the entire margin of Pine Island is a transition area between the island vegetation and that of the surrounding glade. In this transition are all the pineland species listed for the island and an additional group of low pineland plants not found on the island proper. Apparently the transition zone approaches low pineland conditions. However, its outer margin is glade-like for Mariscus jamaicensis, characteristic of the glade, extends into the transition zone about fifteen feet.

Species found only in the transition zone are:

Pluchea foetida

Hyptis radiata

Piriqueta glabrescens

Bletia purpurea

Piriqueta tomentosa

Andropogon glomeratus

Centella repanda

Momordica Charantia

Banana Hole

From a distance a banana hole may appear to be a solid mass of broad-leaved trees and shrubs with the shorter shrubs and trees of the pineland mingling with the taller trees of the banana hole. But this is not true for the trees and shrubs are present only as a heavy fringe around the margin. When trees do occur inside this outer circle, they are rather small. The transition from pineland to banana hole vegetation is characterized by a more luxuriant growth of the outstanding shrubs of the pineland with the addition of Dipholis salicifolia.

Just inside the rock rim of the depression is found a very dense growth including Sabal Palmetto with the epiphytic fern, Phlebodium aureum, growing from behind the leaf stalks, Salix amphibia, Ilex Cassine, the custard-apple (Annona glabra), button bush (Cephalanthus occidentalis), and the bay (Tamala Borbonia).

Baccharis halimifolia is often found at the edge of these holes growing six and eight feet tall. In the fall this widely branching shrubby composite is particularly conspicuous for its white pappus on the ripening heads persists for weeks.

The center of some of the holes may retain water and when this is true Proserpinaca palustris forms dense mats. Others which have better drainage are often cultivated. When not in cultivation, they are commonly occupied by Natal grass (Tricholaena rosea) conspicuous because of its wine colored panicles six or eight inches long. This grass has been recently intro-

duced in Florida for forage.

In one banana hole Mariscus jamaicensis was found occupying the central area fringed by a circle of palmetto trees (Sabal Palmetto). Another containing muck, was occupied by Mariscus jamaicensis and Sagittaris lancifolia with a marginal woody fringes made up only of Salix amphibis and Baccharis halimifolia.

Hammock

The vegetation of the hammocks on Pine Island has the same external appearance as that of the banana holes. The periphery of these islands of vegetation tends to be shrubby (Fig. 7), with vines and shrubs making an almost impassible barrier to the interior. The center of the hammock does not retain the impenetrable nature of the margin although, in contrast to the banana holes, the larger trees which are in the interior of the hammock tend to form a solid canopy.

According to Phillips (1940) the tropical hammocks in the Miami region all have live oaks around the edges. No oaks grow on Pine Island, even in association with the hammocks. The trees in the hammocks on the island are generally smaller and seem to be more compact than in hammocks elsewhere. The margins of Pine Island hammocks are dominated by several small trees and shrubs: Sabal Palmetto, Metopium toxiferum, Tetrazygia bicolor, Lapanea guyanensis and Salix amphibis.

The vines associated with this marginal area include Muscadinia Munsoniana, with juicy, edible berries, the Virginia-



Figure 7. Ramrock in pineland at southern tip of Pine Island. Coccothrinax argentea in foreground.



THE UNIVERSITY OF CHICAGO PRESS

creeper (Parthenocissus quinquefolia), Mikania batatifolia, and Smilax havanensis which is very vigorous, climbing to the tops of the trees.

The larger trees of the interior include the bay (Tamala Borbonia) which has the lovely epiphyte, Anacyelis tepensis, with its brown, white and purple flowers growing on the limbs; the bustie (Dinholis salicifolia); and Ficus aurea. Ilex cassine with red drupes and pubescent twigs is a small tree.

Sink Holes

The moist shady walls of the sinks are particularly favorable to the growth of Pteridophytes. Growing flat on the rock low in the sinks is found Salaginella Batoni. Anemia adiantifolia may be found scattered over the walls. Where the sun seems to strike for at least part of the day Bryopteris normalis can be found either growing as a single plant or in groups. Sphenomeris clavata is always present in abundance lining the walls of the sink holes (Fig. 8) mainly around the margins. It seems to be favored by continuous exposure to sunlight.

The only Angiosperm found in the sink holes is Proserpinaca palustris which frequently grows in the moist humus at the bottom. Other species which occur occasionally seem only to have fallen in and do not survive.



Figure 8. Sink hole showing Sphenomeria
clavata around the margin and Meto-
philum toxiferum, a plant characteris-
tic of pineland, at the right.



UNIVERSITY OF MICHIGAN LIBRARY

SUMMARY

1. Pine Island is located south of Miami. It is a rocky key with little relief raised somewhat above the gladeland. It is made up of a rocky formation called Miami oolite.

2. Lumbering, fire, storms, drainage, and cultivation have contributed to the present day vegetational aspects of the island, but the major communities are determined by edaphic factors related to four distinct habitats: pineland, sink hole, banana hole, and hammock.

3. The island is covered with an open pine forest. Within the forest are scattered banana holes which originate as depressions in the oolitic rock. They are forerunners of the hammock stage. The soil in the banana hole and hammock is much more retentive of water than the adjacent pineland. Sink holes, undoubtedly formed by solution, are abundant on the east side of the island.

4. Pineland vegetation appears in four strata: tree layer, shrub layer, herb layer, and ground layer. The only tree is Pinus caribaea which occurs only in open stands. The shrub layer does not reach the lowest branches of the pine and is characterized by such plants as Metopium toxiferum, Croton

linearis, and Tetrazygia bicolor. The herbaceous layer is dominated by the ferns Anemia adiantifolia and Pteris caudata. The ground cover consists mainly of lianas. Between the glade and the pineland is a transition zone that approaches low pineland conditions. This area contains plants not found on the island proper.

5. The vegetation of the banana holes consists of a dense growth of trees and shrubs around the margins and a usually boggy central area which becomes more solid with maturity.

6. The marginal vegetation of the hammocks on Pine Island consists of a dense growth of shrubs and vines such as Sabal Palmetto, Salix amphibia, Parthenocissus quinquefolia, and Mikania batatifolia. Larger trees found in the center include Tamala Borbonia and Dipholis salicifolia. Oaks, characteristic of hammocks elsewhere, are not found on Pine Island.

7. The sink holes on Pine Island support many Pteridophytes and a negligible number of Angiosperms. Sphenomeris clavata is very conspicuous in all sinks.

LITERATURE CITED

LITERATURE CITED

- Bessey, Ernst A.
1911. The hammocks and everglades of Southern Florida. Plant World 14: 268-276.
- Baker, M. F.
1926. Florida wild flowers. The Macmillian Company. New York.
- Batchly, W. S.
1932. In days agone. The Nature Publishing Company. Indianapolis.
- Dodge, C. R.
1894. Subtropical Florida. Scribner's Magazine 15: 345-362.
- Gifford, John C.
1934. The keys and glades of South Florida. Books, Inc. New York.
- Harper, Roland M.
1911. The relation of climax vegetation to islands and peninsulas. Bull. Torr. Bot. Club 38: 515-528.

1927. Natural resources of Southern Florida. Fla. State Geological Survey, 18th Annual Report.
- Harshberger, John W.
1914. The vegetation of South Florida. Wagner Free Institute of Science, Philadelphia 7: 49-189.
- McAllister, Birdie
1938. A study of the flora of Key Biscayne, Dade County, Florida. Unpublished thesis. Duke University.
- Nehrling, Henry.
1933. The plant world in Florida. The Macmillan Co.

Phillips, Walter S.

1940. A tropical hammock on the Miami (Florida) limestone.
Ecology 21: 166-175.

Small, John K.

1929. From Eden to Sahara. Florida's Tragedy. The Science
Printing Company. Lancaster, Pa.

1929. Everglades. Sci. Mo. 28: 80-88.

1931. Palms. Sci. Mo. 32: 240-256.

1931. Ferns of Florida. Science Press. New York.

1933. Manual of the Southeastern Flora. Published by the
author. New York.

APPENDIX

LIST OF SPECIES COLLECTED ON PINE ISLAND

PTERIDOPHYTA

Filicales

Osmundaceae

Osmunda regalis L.

Schizaeaceae

Anemia adiantifolia (L.) Sw.

Polypodiaceae

Acrostichum danneaeifolium Langsd. and Fisch.Phlebodium aureum (L.) R. Br.Ptychostria pinetorum SmallPteris caudata L.Dryopteris normalis C. Chr.Onychomeris clavata (L.) Maxon

Lycopodiales

Psilotaceae

Psilotum nudum (L.) Griseb.

Selaginellaceae

Selaginella Eatoni Hieron

SPERMATOPHYTA

Gymnospermae

Cycadales

Cycadaceae

Zamia integrifolia Ait.

Pinales

Pinaceae

Pinus caribaea Morelet

Angiospermae

Monocotyledones

Alismales

Alismaceae

Sagittaria lancifolia L.

Poales

Poaceae

Andropogoneae

Tripsacum floridanum Porter
Andropogon glomeratus (Walt.) B.S.P.
Hordeastrum secundum (Ell.) Nash.

Paniceae

Paspalum Blodgettii Chas. M.
Paspalum ciliatifolium Michx.
Panicum polycaulon Nash.
Panicum curtifolium Nash.
Tricholena rosea Nees.
Setaria geniculata (Lam.) Beauv.
Chastochloa geniculata (Lam.) Millsp. and Chase
Cenchrus echinatus L.
Euhenbergia capillaris var. filipes (M.A. Curtis)
 Chapm.

Agrostideae

Sporobolus Poiretii (Roem. and Schult.) Hitchc.

Chlorideae

Chloris glauca (Chas. M.) Vasey
Chloris setacea Swartz

Festuceae

Eragrostis Elliottii S. Wats.
Eragrostis ciliaris (L.) R. Br.

Cyperaceae

Sclirpaeae

Cyperus ligularis L.
Cyperus flavescens L.

Rynchosporaceae

Dichromena latifolia Walp.
Rynchospora fascicularis (Michx.) Vahl
Rynchospora cynosa L.
Mariscus jamaicensis (Crantz) Britton
Schoenus nigricans L.

Arecales

Areaceae

Sabal Palmetto (Walt.) Todd
Coccothrinax argentea (Lodd.) Sarg.
Derantia repens (Bartr.) Small

Liliales

Smilacaceae

Smilax havanensis Jacq.
Smilax auriculata Walt.

Amaryllidales

Leucojaceae

Aletris bracteata Northrop

Ixiaceae

Sisyrinchium graminoides Bicknell

Orchidales

Orchidaceae

Encyclia tempensis (Lindl.) Small
Bietia purpurea (Lam.) DC.

Dicotyledones

Choripetalae

Myricales

Myricaceae

Cerothamnus ceriferus (L.) Small

Salicales

Salicaceae

Salix amphibla Small

Urticales

Urticaceae

Rochmeria cylindrica (L.) Willd.

Artocarpaceae

Ficus aurea Nutt.

Ficus brevifolia Nutt.

Ulmaceae

Trema floridana Britton

Trema Lankiana (R. and S.) Blume

Chenopodiales

Amaranthaceae

Iresine Celosia L.

Ranales

Annonaceae

Annona glabra L.

Papaverales

Brassicaceae

Bursa Bursa-pastoris (L.) Britton

Lepidium virginicum L.

Rosales

Amygdalaceae

Chrysobalanus Icaco L.

Ceobalanus oblongifolius (Michx.) Small

Mimosaceae

Leucaena glauca (L.) Benth.

Cassiaceae

Peiraisia bahamensis (Will.) Britton and Rose
Chamaecrista brachiata Rollard

Fabaceae

Crotalaria pumila Ortega
Medicago lupulina L.
Petalostemon carneus Michx.
Galactia volubilis (L.) Britton
Bradburya virginiana (L.) Kuntze
Vigna repens (L.) Kuntze
Heliconia cana (Swel.) Blake

Geraniales

Malpighiaceae

Byrsenianthus cuneata (Turez.) F. Wilson

Polygalales

Polygalaceae

Asclepias leiodora (Blake) Small
Polygala tinctoria Small

Euphorbiales

Euphorbiaceae

Phyllanthus pruinosa Poepp.
Ocotea linearis Jacq.
Ditaxis Biodietii (Torr.) Pax.
Acalypha chamaedrifolia (Lam.) Muell Arg.
Fraxia sericosa Small
Stillingia angustifolia (Torr.) S. Wats.
Stillingia syntherisma (Muell. Arg.) Small
Stillingia tenuis Small
Diversea stipulosa (Michx.) Raf.
Miconia communis L.
Chamaesyce adhaerens Small
Chamaesyce hirta (L.) Willsp.
Chamaesyce hyssopifolia (L.) Small
Chamaesyce sp. (three undetermined sp.)
Poinsettia pinetorum Small
Poinsettia cyathophora (Murr.) Small

Sapindales

Spondiaceae

Petraria taxiferum (L.) Krug and Urban
Petraria leucantha Jacq.
Leucocarpus radicans (L.) Kuntze

Aquifoliaceae

Ilex Cassine L.

Dodonaeaceae

Dodonaea jamaicensis DC.

Rhamnales

Vitaceae

Passiflora leucomenis (Simpson) Small
Passiflora quinquefolia (L.) Planch

Malvales

Malvaceae

Sida acuta L.
Urena lobata L.
Abutilon virginicum (L.) A. Gray

Buettneriaceae

Abutilon eximium Griseb.
Abutilon americanum L.

Hypericales

Hypericaceae

Hypericum hypericoides L.

Turneraceae

Turnera ulmifolia Small
Turnera tomentosa H.B.K.

Passiflorales

Passifloraceae

Passiflora pallida L.

Thymeleales

Lauraceae

Tamala Borbonia (L.) Raf.

Cassythaceae

Cassytha filiformis L.

Myrtales

Melastomaceae

Tetrazzia bicolor (Mill.) Cogn.

Terminaliaceae

Conocarpus erecta L.

Myrtaceae

Leptosia longipes (Nerg.) Small
Palafox Guajava Raddi

Epilobiaceae

Ludwigia microcarpa Michx.
Samolus repens Willd.
Samolus elaeagnifolius Small

Gunneraceae

Proserpinaca palustris L.

Amiales

Amiaceae

Aryzema Baldwinii Wreng.
Hydrocotyle Canbyi Coult. and Rose
Centella asiatica (Pers.) Small
Spergularia divaricata (Walt.) Raf.

Primulales

Primulaceae

Samolus abjectus (M.B.H.) Baud.

Ardisiaceae

Myrsine guayanensis Aubl.

Ebenales

Sapotaceae

Dioscorea salicifolia (L.) A. DC.
Mussaenda acclinata Vent.

Gentianales

Spigeliaceae

Cynoctenium nitroideum (L.) Britton
Polyrrhiza procumbens L.

Gentianaceae

Opuntia cuneolata (L.) Torr.

Asclepiadales

Apocynaceae

Asclepias corallipes Small
Leites Leites (L.) Britton

Asclepiadaceae

Asclepias Rolfii Britton
Asclepias viridis (L.) A. Gray
Metastelma Blodgettii A. Gray

Polemoniales

Convolvulaceae

Ipomoea tenuissima Choisy
Sarcocolla microdactylum (Griseb.) House
Jacobsonia Cartissii Peter

Solanaceae

Physalis Elliottii Kunze
Solanum nigrum L.

Heliotropiaceae

Heliotropium Leavenworthii Torr.

Verbenaceae

Verbena hastata L.
Physa molliflora (L.) Greene
Valerianella jamaicensis (L.) Muntze
Lantana depressa Small
Lantana involucrata L.
Callicarpa americana L.

Lamiaceae

Salvia privaldes Benth.
Pycnothymus rigidus (Bart.) Small
Hyptis radiata Willd.

Rhinanthaceae

Capraria biflora L.
Securidaria acuminata (Walt.) Small
Securidaria acuminata peninsularis Pennell
Apollonia fasciculata (Mill.) Walp.
Buchnera elongata Sw.

Acanthaceae

Tubiflora angustifolia (Fernald) Small
Dyschoriste angusta (A. Gray) Small
Ruellia parviflora (Nees) Britton

Pinguiculaceae

Pinguicula pumila Michx.

Rubiaceae

Rubiaceae

Houstonia filifolia (A. Gray) Small
Randia scalcata L.
Cephalanthus occidentalis L.
Cuettaria elliptica Sw.
Cuettaria scabra Vent.
Chiococca nictitans Britton
Corinda holocarpa L.
Ernodea angusta Small
Diodes virginiana L.
Diodes hirsuta Pursh.
Borreria terminalis Small
Borreria ocimoides (Burns.) DC.
Galium tinctorium L.

Campanulales

Cucurbitaceae

Aecitaria venusta L.
Helottaria crassifolia Small
Homocidus Guarantia L.

Lobeliaceae

Lobelia glandulosa Walt.

Carduales

Ambrosiaceae

Ambrosia elatior L.

Carduaceae

Erigeron capillifolium (Lam.) Small
Conoclinium coelestinum (L.) DC.
Mikania batatifolia DC.
Laciniaria Chapmanii (T. and G.) Kuntze
Laciniaria aracilla (Pursh) Kuntze
Pityopsis graminifolia (Michx.) Nutt.
Solidago mexicana L.
Aster adnatus Nutt.
Aster coridifolius Michx.
Erigeron hieracifolius Lam.
Lentillon condense (L.) Britton
Reichardia linearifolia L.
Pluchea foetida (L.) DC.
Pluchea petiolata Cass.
Melanthera parvifolia Small
Coreopsis Leavenworthii T. and G.
Hibiscus pliosus L.
Flaveria linearis Lag.
Pectis leptoccephala (Cass.) Urban
Erechtites hieracifolia (L.) Raf.
Cirsium Smallii Britton

Cichoriaceae

Hieracium megacephalon Nash
Senecio asper (L.) All.

[illegible]

Form 335-40M-6-39-S

X A.M. E37 411719

Elder

-Vegetation of Pine Island

Dade County, Florida

DATE

ISSUED TO

X A.M. E37

411719

Duke University Libraries
Elder, Frances Ruth.
A.M. E37 1941 c.1
D91000760N

